

## The Impact of Financial Education Workshops for Teachers on Students' Economic Achievement

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### Introduction

Increasingly, states are emphasizing economics as part of their mandated curricula. According to the National Council on Economic Education (NCEE), 17 states require that students complete an economics course prior to high school graduation, and seven states require that students complete a course in personal finance (NCEE, 2007). In addition, 22 states require that students be tested in economics, while only nine states require testing in personal finance. Unfortunately, few teachers have training in economics and, more specifically, personal finance. In fact, Walstad (2001) found that the average economics teacher has had no more than one course in economics.

Since 1977, researchers have called for more training for economics teachers (Mackey, Glenn, & Lewis, 1977). To fill the training gap, NCEE, its state Councils, and college- and university-based Centers conduct in-service training workshops. These workshops offer teachers an opportunity to develop a better understanding of economic and financial concepts by introducing them to materials that aid them in preparing classroom activities and lesson plans. A major thread of the NCEE materials emphasizes personal finance skills, with *Financial Fitness for Life* (FFFL) being NCEE's flagship publication in the area of personal finance. The FFFL curriculum is available in English and Spanish and has sections that are appropriate for grades K-12. It includes lesson plans for teachers, workbooks for students, and materials that can be shared with parents. Lyons, Scherpf, and Roberts (2006) found that the parent component helped some students

talk more openly with their parents about personal finance skills, particularly those students who were already talking with their parents about financial issues.

As an affiliate of the NCEE, the Georgia Council on Economic Education (GCEE) has offered hundreds of workshops to thousands of Georgia's teachers since its inception in 1972. GCEE offers most of these workshops at no charge to teachers. FFFL workshops typically last one day and provide instructors with an introduction to the FFFL curriculum, as well as an overview of other NCEE materials that can be used to teach personal finance skills in the classroom. Workshops are conducted at various locations across the state and throughout the year. There is some evidence that workshops, similar to those offered by GCEE, help teachers improve students' economics test scores (e.g., Highsmith, 1974; Thorton & Vredeveld, 1977; Walstad, 1979; Schober, 1984; Weaver, Deaton, & Reach, 1987).

In this paper, we examine the test scores of Georgia students who took the state-mandated End-of-Course Test (EOCT) in economics. Georgia is one of the few states which require its students to take both an economics course in high school and an end-of-course competency test on basic economic concepts. The test covers five content domains: (1) Fundamental Economic Concepts, (2) Producers and Consumers, (3) Microeconomics: Elements in the Marketplace, (4) Macroeconomics: the National Economy, and (5) the International Economy. Personal finance content is found throughout the test, but primarily in the Producers and Consumers section. The EOCT counts for 15% of each student's high school economics class grade and therefore qualifies as a "high-stakes" test. Consequently, Georgia provides a unique opportunity to examine the impact that teacher training workshops have on students' performance on a high-stakes standardized economics test.

In this study, we compare the scores of students whose economics teachers participated in a FFFL training workshop conducted by GCEE to those whose economics teachers did not. Our approach is similar to Bosshardt and Watts (1990, 1994) and

Watts and Bosshardt (1991) in that we develop an implicit education production function that determines student test performance and controls for student characteristics that have been previously shown to affect student performance. There are many potentially important school influences that we cannot observe. For this reason, we use panel data techniques, which allow the intercept of the estimated model to shift to accommodate unobserved time-invariant school characteristics. We also control for time trends within the data. We find that after controlling for all of these factors, students whose teachers attended a FFFL workshop scored better than those whose teachers did not.

### Background

There has been research documenting the impact that teacher training workshops and seminars have on the ability of instructors to effectively teach economics. Most of the research looks at the impact that teacher trainings have on student performance on standardized tests in economics. (See Table 1 for a summary of these studies.) The estimated impact of a teacher workshop has ranged from less than one percentage point of the expected student test score to over a ten percentage point difference.

Little research has examined the impact that teacher trainings have on students' test scores in personal finance. However, there has been a great deal of interest in assessing the impact of financial education programs in general (see Lyons, Palmer, Jayaratne, and Scherpf (2006) for an overview). In part, this research is motivated by a national interest in having students (and individuals from various economic backgrounds) master personal finance skills. Consequently, much of the research focuses on the effectiveness of different educational programs in changing the financial behaviors of students and other individuals. For example, Baron-Donovan, Wiener, Gross, and Block-Lieb (2005) found that people of different educational backgrounds can be trained to provide effective personal finance

Table 1  
*Summary of Previous Findings on the Impact of Workshops on Student Test Scores*

Study	Sample Size (students)	Treatment	Test Vehicle	Treatment effect (% increase of test score)	Pre Test
Bosshardt & Watts (1990)	1136	College credit hours and workshops	TEL	Credit Hours: 0.60% Workshops: 0.20%	Yes
Highsmith (1974)	620	Workshops	TEU	2.94%	No
Schober (1984)	1889	Workshops	TEL	4.00%	Yes
Thornton & Vredevelde (1977)	562	Seminars/workshops	TEU	1.22%	No
Walstad (1979)	333	Workshops	TEE	6.50%	No
Walstad (1980)	563	Workshops	TEE	8.90%	Yes
Weaver et al. (1987)	1225	Workshops	TEL	10.75%	Yes

TEL = Test of Economic Literacy, TEU = Test of Economic Understanding, TEE = Test of Elementary Economics

education to debtors. They identify a dearth of studies that have examined the effectiveness of teacher training programs related to financial education. In another study, Lyons, Chang, and Scherpf (2006) found that personal finance programs positively changed the financial behaviors of not only the program participants but also the instructors who taught the programs.

A few studies have documented the impact of the *Financial Fitness for Life* curriculum. Harter and Harter (2007) found that the FFFL materials have a positive impact on students' knowledge of personal finance concepts. Lyons, Scherpf, and Roberts (2006) also found that the FFFL curriculum had measurable benefits with respect to individuals' personal finance skills and abilities.

This study looks at the impact that FFFL teacher training workshops had on students' performance on a standardized economics test. Using data collected from the Georgia

Department of Education (GaDOE) and the Georgia Council on Economic Education (GCEE), we demonstrate the role that teacher training in personal finance can play in the development of students' economic understanding. While we do not pre- and post-test the economics teachers or the students, we do have a substantial control group of teachers who have not participated in a FFFL workshop. Furthermore, because the EOCT counts toward the students' final grade in their high school economics course, the test should accurately reflect their understanding of the subject matter.

### Data

Data for this study were taken from two primary sources. Statewide administrative data on test scores and student characteristics were taken from the Georgia Department of Education (GaDOE). Information on teacher attendance at workshops was gathered from GCEE. The entire data set consisted of all students who took an economics class in a Georgia public high school over a five-semester period, spanning spring 2004 to spring 2006.

Upon completing their high school economics course, students were required to take the economics EOCT. The economics EOCT is a 90-question, multiple-choice standardized test of economic knowledge. At each high school, the EOCT is proctored by a teacher and one other adult, typically a teacher with a free period, a paraprofessional, or a school administrator. The tests are timed. At the end of the allotted time, the teachers submit the tests to the school office. In turn, the school sends the tests via courier (a school system employee) to the GaDOE which sends the exams via courier (a GaDOE employee) to the vendor that manages the state's standardized curriculum-based tests. The vendor grades the tests and returns them to the GaDOE which then returns them back to the schools. Students' scores on the economics EOCT can range from 400 to 950. The economics teachers receive the graded tests approximately one week after

they are administered. According to Georgia State Law, the EOCT test counts for 15% of students' final grade in their high school economics course.

Between spring 2004 and spring 2006, 174,601 high school students in Georgia took the economics EOCT. Our final sample, described below, includes 84,582 of these students. For each observation, we know the student's EOCT test score and have limited demographic information on the student's gender, race, economic status, and disability status. See Table 2 for a summary of the descriptive statistics. Gender is represented by a dummy variable that equals one for "Male" and zero for "Female." Race is a vector of four dummy variables that represent the categories "Black," "Asian," "Hispanic," and "Other." "White, non-Hispanic" is the omitted comparison group. Economic status is defined by a dummy variable labeled "Poor," which is equal to one if the student was categorized by the GaDOE as being economically disadvantaged (e.g., eligible for a free or reduced-price lunch). Similarly, the dummy variable labeled "Disability" equals one if the GaDOE defined the student as having some type of disability.

Table 2  
Descriptive Statistics (N=84,582)

Variable	Mean (s.d.)	Variable	Mean (s.d.)
EOCT Score	609.15 (58.33)	Hispanic	0.04 (0.20)
Poor	0.32 (0.47)	Other	0.01 (0.12)
Disabled	0.07 (0.26)	FFFL Workshops	0.05 (0.22)
Male	0.48 (0.50)	SY 2004	0.18 (0.39)
Black	0.37 (0.48)	SY 2005	0.46 (0.50)
Asian	0.03 (0.16)	SY 2006	0.36 (0.48)

Because we have data that spans three school years, we are able to match students' test scores to teacher attendance in a FFFL workshop. Specifically, each student was matched to a teacher record. We then matched each teacher to his/her history of GCEE workshop attendance. We restricted the sample to

economics teachers who attended a FFFL for the first time and thus had not previously participated in a FFFL workshop. We further restricted the sample to include those who had not previously attended another type of GCEE workshop so that we could better isolate the effect of the FFFL workshop. Note that no teacher in our sample attended more than one FFFL workshop over this time period. Also, we carefully documented the timing of when a teacher completed a workshop versus when the student took the economics EOCT. For example, if a teacher completed a FFFL workshop in 2005, student records from 2004 reported that the teacher had not participated in a FFFL workshop, while student records from 2005 and 2006 reported that the teacher had participated in a workshop.

In the end, our final sample consisted of 84,582 student observations; 4,383 of these students (5.2%) had an economics teacher who was trained in the FFFL curriculum. In total, there were 1,518 individual teacher records in the sample. Of these, only 58 of the teachers (3.8%) had completed a FFFL training workshop.

There are two additional issues we have to acknowledge before we can estimate the impact that FFFL workshops have on students' economic performance. These issues are related to selection bias and the lack of pre-test information.

Ideally, we would have liked to have had a randomized, control-group study where teachers were randomly assigned to a treatment (FFFL workshop) or control group (no workshop). *A priori*, we do not know which types of teachers are more apt to participate in a FFFL workshop. It could be that teachers who are more motivated to teach well also are more likely to attend the workshops to improve their financial knowledge. This could result in an upward bias in the results. However, by eliminating teachers who have previously attended a FFFL workshop (or any other GCEE workshop), we are likely minimizing this potential bias.

Yet, the impact of the FFFL workshops could also be greater for teachers who have not previously demonstrated a commitment to teaching economics or personal finance, because they have

greater room to improve their teaching. This could result in higher student test scores. If this is the case, then our estimates may be overstating the impact of the FFFL workshops because we are focusing on teachers who attended a FFFL for the first time. In either case, the coefficient on the variable that indicates whether a teacher participated in a FFFL workshop is likely capturing two things—the true effect of the workshop on student learning and the impact of unobserved characteristics that pertain to the instructor’s ability and willingness to teach personal finance. Note that, in another study of all GCEE workshops, we found that selection bias did not significantly impact the results. We showed that the sample of economics teachers who completed a GCEE workshop, which included FFFL workshops, was representative of the population of economics teachers in Georgia as a whole (Swinton, De Berry, Scafidi, & Woodard, 2007).

Finally, most studies that have examined the effect that teachers have on learning examine the change in student test scores over a defined length of time (usually a semester). Georgia does not pre-test students in their knowledge of economics before they take their mandatory economics class, and this tempers our results. However, because we observe a large number of students with a broad range of personal characteristics all taking the same high-stakes test, we do gain some insight into the impact that teacher training workshops can have on expected student performance. In short, we rely on our large sample size to isolate the impact of the training workshops.

### Model

Although we observe student characteristics in our data, we do not observe school characteristics that might affect student performance. Therefore, like Bosshardt and Watt (1990, 1994) and Watt and Bosshardt (1991), we use a fixed-effects linear regression model, which allows the intercept term to vary across schools relative to one comparison school. The different intercept

terms capture school-specific characteristics that may contribute to students’ success.

We specify the model as follows:

$$EOCTScore_{it} = \alpha_s + \sum_j \beta_j Student_{it} + \beta_8 FFFL_t + \gamma_1 SY2005 + \gamma_2 SY2006 + \varepsilon_{it}$$

In this model, student-level observations are indicated by the subscript  $i$ , and teacher-level observations are indicated by the subscript  $t$ . The dependent variable ( $EOCTScore_{it}$ ) is defined to be a student’s score on the economics EOCT. The score is conditional on student characteristics ( $Student_{it}$ ), which given data constraints, are restricted to gender, race, economic status, and disability status. The score also is dependent on a teacher’s participation in a FFFL workshop ( $FFFL_t$ ), which equals “1” if the teacher attended a *Financial Fitness for Life* workshop and “0” otherwise. Table 2 does not show the statistics by year. However, average test scores on the economics EOCT increased over the three-year period. We include year dummies ( $SY2005$  and  $SY2006$ ) to account for changes in test scores over this time period. Remember that the intercept term,  $\alpha_s$ , represents the difference in unobserved school characteristics. While we assume that the slope coefficients are the same for each of the schools, we do not make the same assumption for the intercept term.

### Results

Table 3 presents the results for the fixed-effects regression model. In general, our model explains roughly 31.2% of the variation in the dependent variable. The F-statistic indicates that the null hypothesis of equal intercept terms can be rejected.

With respect to the regressors, we found that all of the coefficients on the student characteristics had a significant effect on student test scores, and the signs of the coefficients were consistent with previous research. Specifically, our results showed that low-income students, students with disabilities, students who

were a member of a minority/ethnic group (black, Asian, and Hispanic), and female students scored significantly lower on the economics EOCT, all other factors held constant. All of these coefficients had a p-value less than 0.01.

Table 3  
Fixed-Effects Regression Results (N=84,582)

Dependent Variable = Students' EOCT score in economics		
Independent Variables	Coefficient	Standard Error
Constant	609.72	(0.49) **
Poor	-13.35	(0.43) **
Disabled	-46.94	(0.66) **
Male	9.72	(0.34) **
Black	-32.22	(0.48) **
Asian	-4.56	(1.19) **
Hispanic (non-white)	-27.57	(0.90) **
Other race	-9.85	(1.42) **
FFFL	3.37	(1.35) *
SY2005	17.87	(0.48) **
SY2006	20.88	(0.52) **
Adj R <sup>2</sup>	0.3124	
F (10, 84,241)	1564.61	

Notes. Omitted categories include: female, white (non-Hispanic), non-disabled, non-poor, and SY2004.

\* p < 0.05, \*\* p < 0.01

Recall that the focus of this study was to examine the effect that teacher attendance at FFFL training workshops had on student test scores. Having an economics teacher who attended a FFFL workshop increased the expected student EOCT score by 3.4 points, or a little more than half a percent of the average economics EOCT score. While this effect appears small relative to the other effects presented in Table 3, it should be noted that the FFFL workshops lasted only one day. Furthermore, personal

finance is but one component of Georgia's EOCT in economics. One would not expect workshops that focus on personal finance, such as the FFFL workshops, to have pervasive effects on the other economic topics covered on the test.

Another way to place this result in context is to focus on the relative cost of the FFFL workshops. The GCEE spends roughly \$700,000 per year providing workshops and materials to teachers covering a wide range of economic topics. Less than one-third of the workshops offered focus on personal finance. The Executive Director of GCEE, David Martin, estimates that the FFFL workshops cost roughly \$200 per teacher (personal communication, September 25, 2007). This expenditure is quite modest compared to the total amount Georgia spends on education each year. The fact that these workshops appear to have a statistically discernable impact on student test scores is encouraging. Furthermore, because the GCEE offers the FFFL workshops free to teachers (and pays for substitutes), the cost to schools is negligible.

### Conclusions

The state of Georgia requires all high school students to take an economics course prior to graduation. It further requires these students to take a statewide end-of-course test (EOCT) upon the completion of their high school economics course. This test counts for 15% of their final grade in their high school economics course. For these reasons, Georgia is uniquely suited to analyze the issue of whether personal finance training for high school economics teachers improves student learning.

A primary conclusion of our research is that *Financial Fitness for Life* workshops have a positive impact on students' performance on the Georgia economics EOCT. It is interesting to note that fewer than 10% of the students in Georgia have economics teachers who have completed a FFFL workshop from the GCEE within the past five years. This seems to indicate that a modest increase in workshop attendance could have a positive

effect statewide on student achievement in economics. According to GCEE, this could be accomplished at a relatively low cost – roughly \$200 per teacher. While these findings are suggestive, we hesitate to extrapolate the results to all economics teachers given that few teachers have completed a FFFL workshop to date. Swinton, Berry, Scafidi, and Woodard (2007) did find, however, that teachers taking GCEE workshops seem to be representative of Georgia economics teachers in general.

With the amount of data available from the GaDOE, many opportunities exist to examine subsets of the data. For example, one might want to examine the impact that teacher training workshops have on the economic achievement of specific populations of interest such as minority groups. Also, this study focused on the impact of one particular type of workshop (FFFL). However, different workshops may have different impacts on students' performance in economics.

In addition, it would be advantageous for researchers to work on gathering data with additional controls for specific teacher characteristics. Because we were unable to control for these factors, our “FFFL workshop effect” could be a proxy for teacher or school quality. We know very little about what motivates teachers to attend these workshops. Teacher motivation may help explain both workshop attendance and student learning. With this said, the GaDOE data is still a rich data source that offers a number of opportunities to examine the determinants of student performance and, specifically, the impact that teacher training workshops in economics and personal finance have on student outcomes.

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